UNITED STATES GOVERNMENT

memorandum

DATE: February 16, 1995

REPLY TO ATTN OF: Migratory Bird Field Coordinator, Memphis, TN

SUBJECT: Lower Hatchie Cropland Management Plan

TO: Randy Cook, Refuge Manager, Reelfoot NWR

I have reviewed the subject plan as you requested and it looks good to me. I, like you, am concerned about the extremely low duck and goose use-day objectives. I would suggest a duck use-day objective of at lease 2,200,000 and a goose use-day objective of at least 450,000. In 1991 the evaluation team recommended a goose objective of 1,500,000 use days and a duck objective of 4,000,000 use days.

The very low objectives also greatly diminish the calculated need for forage crops. In fact I would be reluctant to calculate the amount of food resources needed using such low objectives. You might want to use a 110 day wintering period for ducks to calculate the amount of food needed (page 5). This is what was used in calculating duck use-day objectives for the LMV.

I think it would be beneficial to include in the Introduction or somewhere, what ratio of unharvested planted crops to moist soil crops you desire to provide on Lower Hatchie. A ratio of 50/50 was recommended by the evaluation team and this seems reasonable to me. Including this information would give the reader a broad picture of what you are trying to achieve on the open habitat at Lower Hatchie.

Again, the plan looks good to me and thanks for the opportunity to review and comment on it.

Don

enclosure

BCC: Frank Bowers

File Copy

LOWER HATCHIE NATIONAL WILDLIFE REFUGE

CROPLANDS MANAGEMENT PLAN

U.S. Department of the Interior
Fish and Wildlife Service
January 1995

INTRODUCTION

Lower Hatchie National Wildlife Refuge (NWR) was established in 1980 by the Migratory Bird Conservation Commission. The refuge currently encompasses 7,394 acres. The approved acquisition involves 8,600 acres lying along the Hatchie River in Lauderdale and Tipton Counties from about 12 miles west of the town of Henning to its confluence with the Mississippi River. The refuge boundary encompasses the bulk of the remaining bottomland hardwood forest west of Highway 51 along the scenic Hatchie River. Lower Hatchie NWR is currently administered under Reelfoot NWR located near Walnut Log, Tennessee.

The refuge has excellent potential for wildlife management (particularly waterfowl and other species associated with wetlands and bottomland hardwood forests) and hardwood forest management. Public recreational opportunities are limited in that portion of Tennessee, making Lower Hatchie a frequently visited area by hunters and fishermen throughout the year.

The primary purpose of the refuge is to be an inviolate sanctuary for migratory birds. A primary objective is to preserve for the public benefit a representative portion of the bottomland hardwood forest as habitat for wintering waterfowl and other migratory birds. Land types include palustrine and lacustrine areas, bottomland hardwood forest, semi-permanent grasslands,

upland forests, miscellaneous administrative lands, and croplands. Developed impoundment areas on the refuge adjacent to the Mississippi River are managed for ducks, primarily mallards and the Mississippi Valley Population Canada geese. The bottomland hardwood forests and the cropland areas are the dominant habitat types of the refuge, comprising 4,318 acres (58%) and 1,236 acres (17%) respectively.

The average annual rainfall in the vicinity of the refuge is near 50 inches. The wettest period of the year is January through March, with rains and river flooding conditions common. The driest period of the year is late-July through October, when rainfall is limited and river levels are at their lowest. In most years the cropland areas are flooded by backwater from the Hatchie River. However, Hatchie River levels are affected by Mississippi River levels. High water in the Mississippi will act like a dam, causing the Hatchie River to "back-up" and flood its banks. Extremely low Mississippi River levels will tend to "draw out" water from the Hatchie River, even if heavy rains have elevated the Hatchie River upstream.

Several soil types occur on the refuge including Amagon-Oaklimeter silt loam, Robinsonville-Crevasse-Bruno sandy loams, Sharkey series clays and clayey loams, and Memphis-Adler-Loring silt loams.

Refuge objectives approved in 1987 established a waterfowl

I suggest 2,200,000 duck use-day objective and 450,000 goose use-day objective. DHO 4

maintenance output of 200,000 use-days for geese and 500,000 use-days for ducks. To meet these objectives the refuge began to implement a farming (open lands) management program as suitable lands were acquired. At the time the refuge objectives were approved (September 1987), the refuge consisted of only 4,140 acres. Since then additional lands have been acquired, including non-forested lands now part of the refuge cropland areas. Therefore, refuge objectives (particularly for waterfowl maintenance) should be re-evaluated and modified to reflect the present size of the refuge. Meeting the waterfowl maintenance objectives (providing wintering and migrating habitat) can be achieved in part through a successful cropland program.

I totally Agree! DHO

By incorporating a system of impoundments with the cropland program, the waterfowl maintenance objectives should be easily achieved. Preferred waterfowl crops include corn, milo, millets, wheat, buckwheat, and natural (moist-soils) foods. By planting crops such as corn or millets in impoundment areas, their availability to waterfowl can be enhanced through flooding in fall/winter. A portion of the cropland area is on upland and highly erodible sites and is best suited for haying and winter wheat planting. In addition, certain portions of the cropland area tend to be wetter longer than others and are best suited as moist-soils management sites.

You might add, somewhere, the desired unharvested planted crop to moist soil crop ratio that you are trying to achieve. The 1991 evaluation recommended a 50/50 ratio which seems appropriate

DHO

Assuming a 1/4 lb/duck/day rate of grain consumption, a diet consisting of 50% grain and 50% moist soils (5% of diet may be obtained from off-refuge sources**), the annual winter (90 day period) food requirement for meeting the current 500,000 use day refuge objective for ducks can be easily met with an annual production of 14 acres of corn (or milo) yielding 75 bu/ac (1,050 bu, 63,000 lbs) in combination with 91 acres of managed moist soils yielding 690 lb/ac in seed production (62,790 lbs).

→ 110 days were used for LMV objectives, DO.

Assuming a daily goose diet consisting of 1/2 lb. grain or 1 lb. green browse, an overall, winter-long grain/green-browse dietary ratio of 50/50 (and 5% of diet obtained from off-refuge sources), the annual (90 day period) food requirement for meeting the 200,000 use day refuge objective for geese can be met with an annual production of 11.1 acres of corn (or milo) yielding 75 bu/ac (833 bu, 50,000 lbs) in combination with 50,000 lbs. of annual green browse (winter wheat) production.

In summary, current annual refuge waterfowl use day objectives may be met by production of 25.1 acres corn (or milo) yielding 75 bu/ac (1,883.33 bu), 91 acres of managed moist soils yielding 690 lbs seed/ac (62,790 lbs), and 44.4 acres of winter wheat (50,000 lbs, 1,125 lbs/ac yield).

**** This figure was chosen due to the preponderance of cotton as the major crop on adjacent agricultural lands, which largely excludes the possibility of adjacent private lands waste grain scavenging by local overwintering waterfowl.**

These requirements are well within the capacity of available managed moist soils acreage and government-share row crop acreage in the framework of the Cooperative Farming Program.

COOPERATIVE FARMING PROGRAM

A "cleared areas" management plan/program was initiated on Lower Hatchie NWR as agricultural lands became available during the acquisition phase. No formal farming/agricultural management plan has been developed prior to this document, however a cooperative farming program has been in place since 1982 using the "cleared areas" document in lieu of a croplands plan. Early in the program the refuge maintained agreements with five different farmers. Changes in management needs and administration priorities has reduced the number of cooperative farmers to currently two (2).

Contracts with cooperative farmers are renegotiated annually prior to the planting season. At that time the acreage amount and location of the cooperative farmer's share and refuge share are negotiated and all provisions of the agreement are discussed and agreed upon by both parties and the agreement signed by the cooperative farmer and the Service representative (refuge manager). A 3/4 cooperator share : 1/4 refuge share, on an acreage basis, is standard for all row crops. Modifications to the original contract

may occur throughout the farming season with amendments agreed upon and signed by all parties involved.

Special conditions stated in the agreement include the following:

1. Preferred seeding dates for refuge share of crops are:

Corn	March 25-June 30	Millet	May 1-July 15
Milo	May 1-June 15	Buckwheat	July 15-Aug 15
Soybeans	April 25-July 1		

   In the event a preferred seeding date cannot be accomplished, the Cooperator(s) must contact the refuge manager immediately to schedule alternate dates or crops prior to planting.

2. The Service will specify its share to be left standing in the fields, harvested, bushhogged, or to be logged down by the Cooperator(s). The cooperator will notify the Service of any harvesting activity at least 48 hours prior. All manipulations must be completed within 48 hours from the date of notification unless weather conditions prohibit work.

3. All crops will be fertilized/limed according to current University of Tennessee or University of Kentucky Soil Testing Laboratory analysis. Soil tests must be taken every three years beginning in 1992. The cooperator is

responsible for all soil testing and will provide the Service with the soil test results in designated years.

4. Cooperator(s) will not be permitted to use any herbicide or insecticide prior to the completion and approval of a Chemical Control Proposal. The attached list of approved chemicals is provided. Cooperator(s) may submit additional chemical use proposals in writing to the manager for emergency approval.
5. The Cooperator(s) must notify the refuge manager 24 hours in advance of any proposed application of fertilizer, herbicide or insecticide.
6. The Cooperator(s) must read and strictly comply with all label instructions on any pesticide used.
7. The Cooperator(s) must meet Tennessee Department of Agriculture requirements for Pesticide Applicator Certification.
8. Cooperator(s) agree that he will not permit the draining or dumping of any materials, and must remove same from the refuge at the end of each day.
9. All farming operations are to be conducted in accordance with the Occupational Safety and Health Administration (OSHA) guidelines.

10. The Cooperator(s) will control weeds by cultivation during the growing season if necessary.
11. Weeds and woody vegetation in field borders and turnrows will be controlled by the cooperator by mowing only (no earlier than July 1 or preferably after July 15).
12. Pesticides approved for use (see attached) will not be allowed unless the level of pest occurrence observed as a result of crop scouting indicates that pest density is at the economic threshold level. The cooperator is responsible for crop scouting.

MOIST SOILS MANAGEMENT

Managing for the production of natural wildlife food and cover plants has become an accepted option for managing seasonally flooded impoundments in many parts of the United States. A discussion of moist-soils management is appropriate within the context of this plan due to the marginal nature of much of Lower Hatchie's agricultural lands.

Approximately 192 acres of cropland in the Lauderdale county portion of the refuge (fields 13, 14, 20, 20a, 20b, 21, 22, 24, 25, and 26) are more adversely affected by river flooding and poor drainage than other fields on the refuge. In most years, these

agricultural fields are undesirably wet through April and seldom dry sufficiently enough to plant desired hot foods such as corn. Planting crops in these marginal areas has historically been rotated between the Service and the cooperator. In most years, only late-planted crops such as "cooperator-share" soybeans or "Service-share" millets or moist-soils have been successful. Therefore, these areas are best managed for moist-soils production.

When managed for moist soils, these areas produce outstanding stands of wild millet, smartweed, sedges, sprangletop, and other food species in spite of poor water management capability. Soil disturbance is required to maintain moist soil areas in desired successional stages for waterfowl management. Most desirable wild food plants are early successional, high seed producing annuals. The wetness of these fields limits the ability to use mechanical methods to control weeds until late in the planting season.

The rotation of these wet areas between moist-soils management and rowcrop farming would be an appropriate method to control undesirable plant encroachment and "set-back" woody plant succession in these sites. Rotations would be no more frequent than two years or as moisture conditions permit. Rehabilitation of the levee system for better water control would permit more traditional moist-soils management to occur, using water levels to control vegetation. Rotational schemes for integrated pest

management in moist-soils areas must be flexible. Frequently, the highest moist soil production is in years immediately following a rowcrop.

Generally, moist soil management for migrant and wintering waterfowl involves drawdowns in spring or early summer. Supplementary actions such as disking or shallow flooding may be required after plants are established. For example, cocklebur, one of the two major herbaceous undesirables at Lower Hatchie NWR, is easily controlled in its seedling stage by shallow flooding for 24-48 hours. Moist-soils areas can be re-flooded in fall to make seeds available to migrant and wintering waterfowl. Options are also available to manage moist-soils areas for wading birds, shorebirds, passerines, and other wildlife.

Proper timing and duration of drawdowns vary with locale and management objectives. Drawdown schemes are developed best when based on several seasons of experience in a given area. Ideally, after several years of experience, drawdowns can be scheduled on a basis of phenology rather than calendar date.

Moist soil management has several advantages over conventional row crop farming. These include: 1. Lower costs for fuel, fertilizer, and seed because natural plants do not require cultivation, are site adapted to soil nutrients and seed is readily available in the soil bank; 2. Greater diversity of plant species

and vegetation structure that supports a more diverse fauna; 3. A more nutritionally complete diet for waterfowl than provided by crop monocultures; and 4. Potential for higher energy efficiency--a greater caloric return in wildlife food for the energy invested than for farming.

Major disadvantages of moist soil are that: 1. Natural plants usually cannot produce as much total food per acre as properly cultivated crops and 2. moist soils management requires more time investment by professional personnel than cooperative farming. Regular inspections of moist soil fields, especially during drawdowns, are necessary to identify responding vegetation and initiate measures to control undesirables or stimulate desirable species. Both moist soil and row crop options are subject to adverse weather, but there are usually desirable moist soils species available to respond to a variety of conditions.

The refuge moist soils management program is in need of a system rehabilitation. Currently the impoundment system in which the moist soil management occurs does not allow for proper water management abilities. Without complete water level control in these areas, the system is truly not considered under moist soils management. Levee redesign, water control structure installation, and development of a water source (well and pump) are critical to the program. Nearly 100 acres of the impoundment system could be

managed annually for moist soils plants. Currently, the areas used for moist soils management are rotated between soybean/corn/millet crops and wild moist soils plants depending upon annual planting conditions.

MANAGEMENT UNITS

Lower Hatchie National Wildlife Refuge croplands operations are separated into two management units (See Attachments 1 and 2): Management Unit 1 (croplands in the Lauderdale county portion of the refuge) and Management Unit 2 (croplands in the Tipton county portion of the refuge).

Management Unit 1, the larger of the two units, is bordered on the west by the Mississippi River and is accessed by Hwy 87 west near Fulton, Tennessee. This unit includes upland and lowland fields, bluff habitat, ponds and sloughs, ditches, levees, and wooded areas. Agricultural Stabilization and Conservation Service (ASCS) farm number 3373 has been designated to Unit 1. Management Unit 1 supports the entire moist soils management program and dominates much of the refuge waterfowl sanctuary. Unit 1 contains the entire refuge impoundment system and produces the majority of the waterfowl food required to meet the refuge objectives.

Management Unit 1 occupies approximately 1,064.7 acres which includes upland and lowland farming areas. The unit is divided

into four (4) sections: South Fulton, North Fulton, Champion Lake, and the Nature Conservancy. Attachment 3 lists the acreage of each farm field within the four sections of Management Unit 1.

Historically, farming acreages were divided by the typical 3/4 farmer : 1/4 refuge ratio with the refuge usually receiving its portion on the lower/wetter fields of the unit. As a result, crops which were planted for the refuge could be flooded for waterfowl use. However, without adequate water control in these areas it was likely that early planted crops such as corn would be flooded and killed before maturing or that high water in spring would prevent the refuge share from being planted at all.

In Management Unit 1, the fields which are considered the lowest in the impoundment system have been identified earlier as moist soils management areas and occupy nearly 192 acres in the South Fulton section of the unit. This extremely low 192-acre portion can produce excellent crops of late-planted soybeans and early-planted corn. However the planting of corn is strictly dependant upon Hatchie River levels and the ability to drain the fields by late spring.

Other low-elevation fields in the impoundment system of the South Fulton section include 4A, 5B, 8, 15B, 12, and 12A; however these fields are slightly higher than those identified for moist soils management. Row Crops such as soybeans, milo, and corn can

be planted on these sites with the latter two crops producing well when planted early. South Fulton fields 17, 17A, and 23 are also considered low and will flood in wet years, but these fields are not impounded by levees. All of the remaining fields in the South Fulton section of Unit 1 are considered higher elevation fields, some of which (1, 2, 2A, 2B, 3, 4, 6, 6A, 10, 10A, 11, 16, 16A, 18, 19, and 19A) never flood at all. Row Crops such as soybeans, corn, and milo have been planted historically with excellent production on dryer sites. South Fulton fields 1, 2, 6, 6A, 10, 10A, 11, and 16A are considered highly erodible lands (H.E.L.) and are reserved for haying only.

The North Fulton section of Management Unit 1 contains 5 fields and is located north of Hwy 87 near Fulton, Tennessee. North Fulton fields 3, 4, and a 1-acre portion on the east side of field 5 are considered highly erodible and are reserved for haying only. The remaining fields in the North Fulton section (1, 2, and 5) are considered upland areas and typically do not flood.

The Champion Lake section of Management Unit 1 is located south of Hwy 87 and is bordered on the west by Management Unit 1. The Champion Lake section is accessed by Champion Lake road and contains 4 fields. Fields 3 and 4 are considered the lowest, with the latter best suited to moist soils management due to its extremely wet condition. Although there are no impoundment levees

in the Champion Lake section, fields 3 and 4 do receive flooding during late winter/spring but field water levels are dependant upon backwater flooding from the Hatchie River. Champion Lake fields 1 and 2 are considered upland and typically do not flood.

The remaining section of Management Unit 1 contains only 1 field of approximately 7.5 acres adjacent to Hwy 87. This section is called the Nature Conservancy section due to the previous ownership of the tract on which the field is located. This field typically does not flood.

Management Unit 2 is much smaller and includes only a 150 acre cropland area along the Hatchie River in Tipton county. The unit is accessed by Club Drive off of Garland-Detroit Road. Club Drive is the main access road into the refuge and to the Hatchie River boat ramp. Although considered part of the refuge waterfowl sanctuary, Management Unit 2 does not receive the intensive waterfowl use as does Management Unit 1 due mainly to frequent human disturbances (via Club Drive) and a much smaller food resource. Unit 2 contains only one section (Burlison) with 5 fields. Attachment 4 lists the acreage of each farm field within the unit.

The lowest fields in the Burlison section are 1, 2, 3, and 4 with field 5 being the only field which typically does not flood. Fields 2, 3, and 4 have consistent flooding problems due to beavers and poor drainage and can be planted early only during extremely

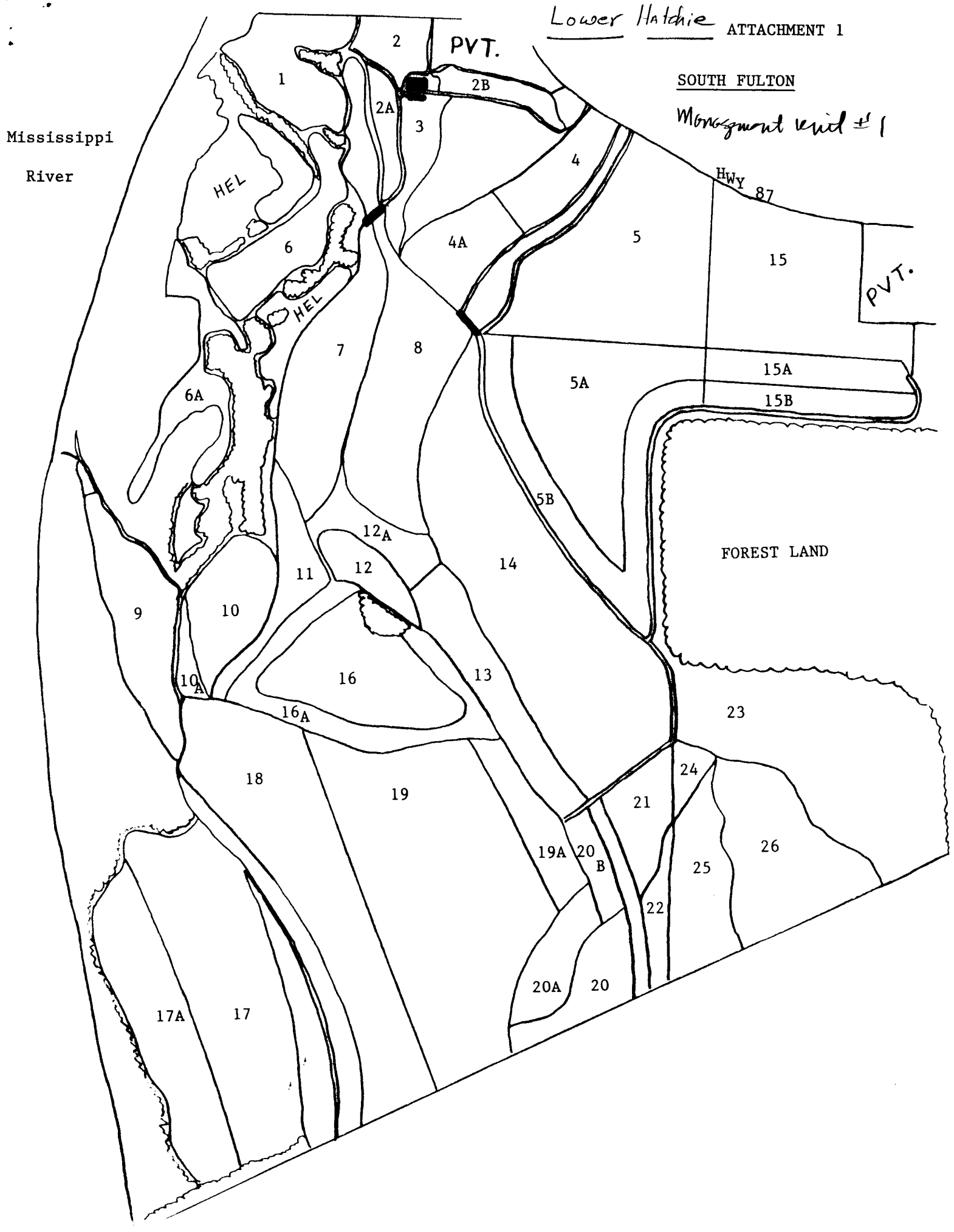
dry years. Field 1 is low but does drain better than fields 2-4 and historically has been planted for the refuge share. Field 5 is the most consistently dry field and can be planted as early as May in most years depending on late spring rains.

LOWER HATCHIE NATIONAL WILDLIFE REFUGE
CROPLANDS MANAGEMENT PLAN

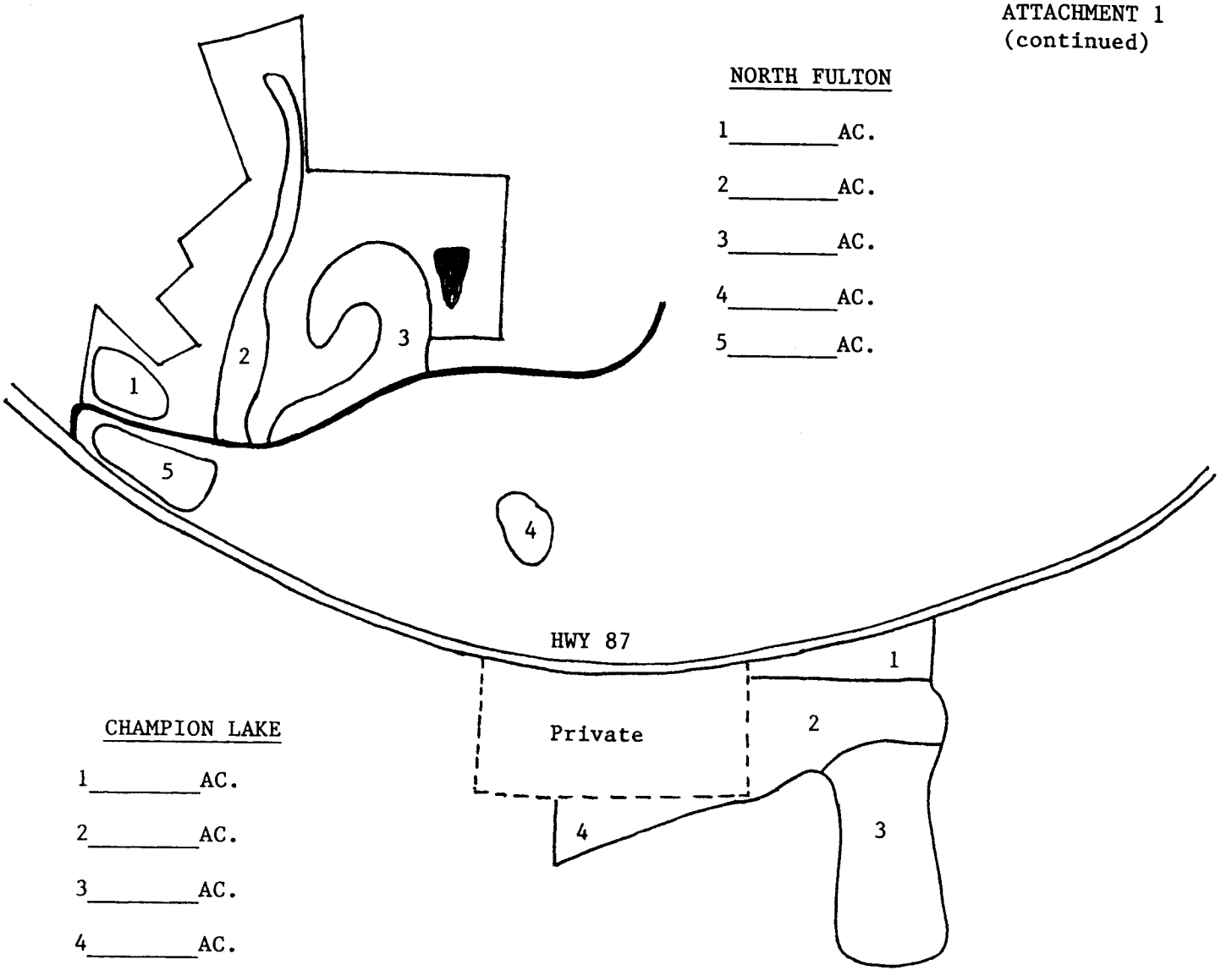
Submitted by: Randy Cook 2/3/95
Refuge Manager

Concurrence: [signature] 2/14/95
WHM Biologist

Approval: _____
Associate Manager (RF-II)


Lower Hatchie
ATTACHMENT 1
SOUTH FULTON
Management unit #1
Mississippi River
PVT.
2
1
2A
2B
3
4
HEL
6
4A
5
HWY 87
15
PVT.
HEL
7
8
15A
5A
15B
6A
5B
12A
FOREST LAND
11
12
14
9
10
16
13
10A
16A
23
18
19
24
21
19A
20B
26
25
22
20A
20
17A
17

ATTACHMENT 1
(continued)



NORTH FULTON

1_____AC.

2_____AC.

3_____AC.

4_____AC.

5_____AC.

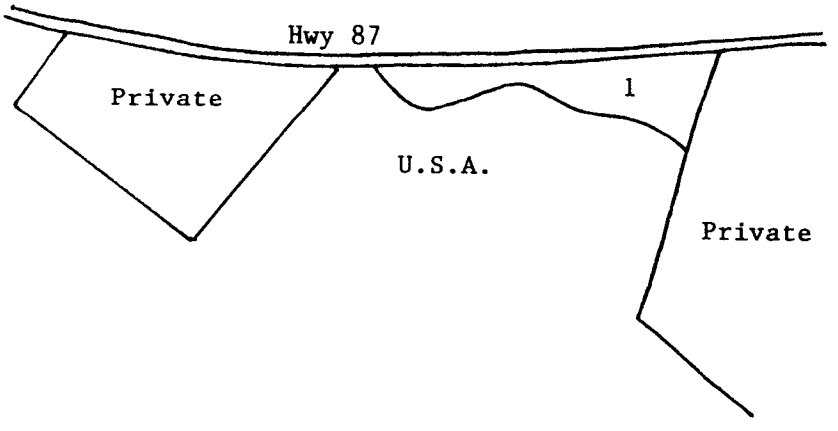
CHAMPION LAKE

1_____AC.

2_____AC.

3_____AC.

4_____AC.

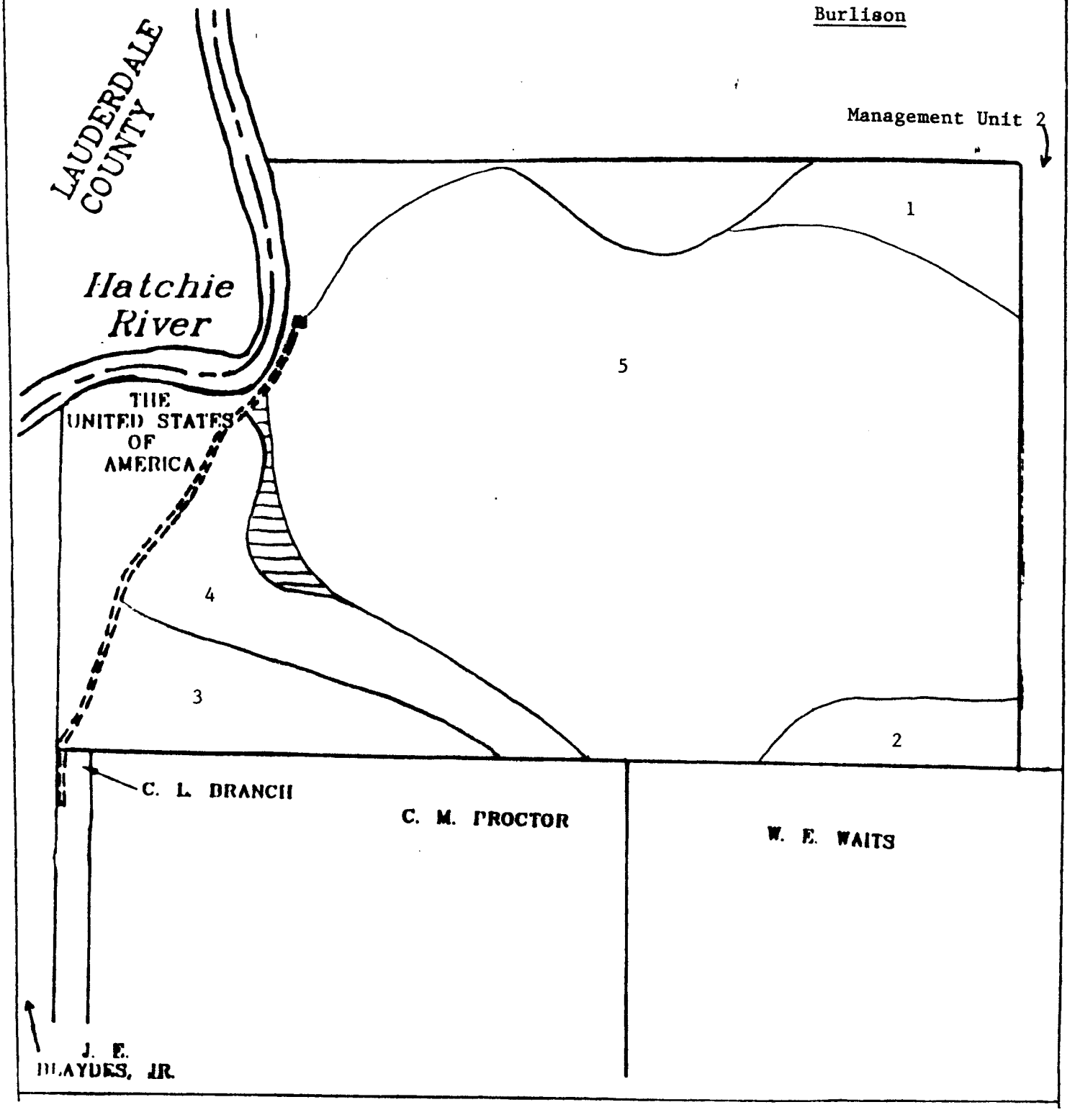


NATURE CONSERVANCY

1_____AC.

ATTACHMENT 2

Burlison



ATTACHMENT 3

Acreages of fields in each of the four sections of Lower Hatchie NWR Cropland Management Unit 1.

Section	Field Number	Acreage	
South Fulton	1	15	Hay
	2	8	Hay
	2A	8	
	2B	5	Hay
	3	10	Hay
	4	15	
	4A	15	
	5	57	
	5A	30	
	5B	35	
	6	15	Hay
	6A	18	Hay
	7	35	
	8	30	
	9	20	
	10	12	Hay
	10A	2	Hay
	11	12.5	Hay
	12	6	
	12A	10	
	13	20	

ATTACHMENT 3 (Continued)

Section	Field Number	Acreage	
South Fulton	14	75	
	15	60	
	15A	10	
	15B	10	
	16	25	
	16A	8	
	17	25	Hay
	17A	59	
	18	62	
	19	92	
	19A	18	
	20	11.7	
	20A	10	
	20B	6	
	21	13	
	22	6	
	23	63	
	24	3	
	25	17	
	26	30	
Total		**982.2**	

ATTACHMENT 3 (Continued)

Section	Field Number	Acreage
North Fulton	1	5
	2	9
	3	6
	4	5
	5	4
Total		**29**
Champion Lake	1	6
	2	14
	3	21
	4	5
Total		**46**
Nature Conservancy	1	7.5
Total		**7.5**

ATTACHMENT 4

Acreages of fields in the Burlison section of Lower Hatchie NWR Cropland Management Unit 2.

Section	Field Number	Acreage
Burlison	1	12
	2	7
	3	8
	4	10
	5	113
Total		**150**

SECTION 7 EVALUATION

REGION: 4 (SOUTHEAST)

LOCATION (ATTACHED MAP):

Hatchie National Wildlife Refuge Complex, Haywood, Lauderdale and Tipton Counties, Tennessee.

LISTED SPECIES OR CRITICAL HABITAT CONSIDERED:

Bald Eagle (Haliaeetus leucocephalus)
Least Tern (Sterna albifrons)

NAME AND DESCRIPTION OF ACTION:

Use of approved pesticides on refuge croplands, moist soil areas and forestlands for wildlife management purposes.

OBJECTIVES OF THE ACTION:

Control of undesirable plants and insects in crops grown to feed migratory waterfowl and resident wildlife, control of willows, sesbania and cocklebur in moist soil units, and control of certain woody plants (timber stand improvement) in refuge forests.

EXPLANATION OF IMPACT OF ACTION ON LISTED SPECIES OR CRITICAL HABITAT:

Proposed action is not expected to affect listed species. All pesticides will receive Regional and Washington approval as appropriate prior to use by cooperative farmers and refuge personnel.

RECOMMENDATIONS TO AVOID ADVERSE IMPACTS OR ENHANCE SPECIES CONSERVATION:

All refuge personnel and cooperative farmers will be required to follow labeled directions for storage, mixing, application, and disposal of containers. Agricultural application will be by low pressure ground spray on calm days.

All personnel applying restricted use pesticides will be certified or under direct supervision of a certified applicator.

Section 7 Evaluation

Project Leader Marjorie L. Nichols Date: 2-14-92
May adversely affect _____ Not likely to adversely affect ✓

FWE Field Supervisor Jack Barclay Date: 2-25-92
May adversely affect _____ Not likely to adversely affect X

ARD Acting - Ivan H. McDaniel Date: 3-2-92
May adversely affect _____ Not likely to adversely affect ✓

ARD-FWE _____ Date: _____
May adversely affect _____ Not likely to adversely affect _____

Regional Director _____ Date: _____
May adversely affect _____ Not likely to adversely affect _____

Biological Opinion _____